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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MITCHELL, KATHERINE W	

ART UNIT	PAPER NUMBER
3677	

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,411	SIGNAROLDI ET AL.	
	Examiner	**Art Unit**	
	Katherine W. Mitchell	3677	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 4/1/7/2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 22-29,36-40,42,43 and 45-52 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 23-29,36-40,45 and 48-52 is/are allowed.

6)☒ Claim(s) 22,42,43,46 and 47 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 17 April 2006 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

The request filed on 4/17/2006 for a Request for Continuing Examination (RCE) under 37 CFR 1.114 is acceptable and an RCE has been established. Any previous finality is hereby withdrawn and a new action on the merits follows. Any newly-submitted claims have been added. An action on the RCE follows.

Drawings

1. The revised drawing is approved.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 22, 42, 43, 46, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolan Jr, DE 2118360, hereafter called Nolan in view of Shell, GB 1107541, hereafter called Shell, and Lynch USP 4986697. Examiner has provided applicant with a translation of Nolan, as the document was cited on the IDS without a translation, and all page and line numbers refer to this translation.

Re claims 22 and 42-43 and 46-47: Nolan teaches a pipe laying vessel and method comprising (page 3, 2nd, 6th, and 7th paragraphs, Figures) an upwardly extending tower (28,68) with a plurality of guiding element rollers (36), spaced along the pipeline path and defining lateral path limits, located such that the rollers allow some

bending of the pipeline as it passes thru the lower guide arrangement (page 5, last 2 paragraphs – top 2 paragraphs page 6, figures, paragraph noted /25 on page 11). Nolan teaches in page 22, paragraph 56 of the translation that his invention is a method of laying pipe in which the angle at which the pipeline penetrates the water can be controlled, and thus inherently both s-laying and j-laying methods and apparatus are taught. Since both s-lay and j-lay are possible since the angle is controllable, the pipeline undergoes some bending such that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide whenever the pipeline penetration angle is less than vertical -- refer to the fact that the angle at which the pipeline penetrates the water can be controlled to be more or less vertical at its lower portion relative to its upper portion. Further, note that inherently ANY pipe that is eventually bent through guide rollers, as opposed to being physically clamped and mechanically bent at the clamped location) will inevitably and unavoidably have at least some "straight" pipe above the guide rollers affected by the bending so that the pipeline as it passes through the lower guide arrangement will be less vertical than the straight pipe at the top of the tower -- the pipe sidewalls at the bend are not in a discrete and sudden bent shape. Guide rollers including axes of rotation inclined toward one another in a plane perpendicular to the tower, and defining the lateral limits of the pipeline, are taught in Nolan Fig 6.

However, Nolan does not teach a means for monitoring the forces, including a load cell, applied to the pipeline by rollers of the lower guide arrangement. Shell

teaches in page 1, col 2, line 77 -- page 2, col 1, line 5, page 5 col 1 lines 15-43, and page 7, col 2, lines 67-93 that it is important to measure and control the pipeline bending when laying the pipeline from a floating vessel, but no specific means for measuring the forces are disclosed. Lynch teaches a method of laying pipeline from a barge which employs load and position sensing means associated with guide rollers to prevent damage to a pipe when the pipe is being laid in a curve in col 3 lines 16-32, and col 8 lines 60-61 disclose that the sensing means can be a load cell.

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Nolan and Shell and Lynch before him at the time the invention was made, to modify Nolan as taught by Shell and Lynch to include load sensing means such as load cells to measure and control the pipeline bending when laying the pipeline from a floating vessel, in order to lay pipelines in a catenary curve in the ocean without damage to the pipeline. One would have been motivated to make such a combination because damage-free pipelaying in different conditions, such as pipe size, bend, water currents would have been obtained, as taught/suggested by Lynch in col 3 lines 30-48 and Shell page 5 col 1 lines 31-42.

Further Re claims 46-47: A flared tower as described is shown in Nolan Fig 3 and 12a-12d. The lower guide assembly is considered to include everything below bracketed section {34] in Fig 1. The angle of flare increases in the direction of pipeline travel during laying in the section between "68" and "88".

Further Re claim 47: A control station of some type is inevitably required for load cells to monitor forces and provide data for operation adjustments.

Further Re claim 47: Lynch teaches in col 7 line 37 - col 8 line 53 and Fig 9 that the force monitoring means' signals can be used to operate a piston and cylinder (piston rod 222 of hydraulic actuator 220) arrangement via a hydraulic supply (254) and control valve (258) station.

Further Re claims 42-43 and 47: Associating force monitoring means with guide rollers has been discussed as taught by Shell above. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have had monitoring means on respective sets of rollers, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8, especially since a bending pipe would be expected to have varying forces along its length and thus multiple measurements would obviously be needed.

Further Re claim 47: Lynch col 7 line 37- col 8 line 42 teaches using piston and cylinder arrangements for operating rollers as well as motivation for using piston and cylinder arrangements in pipe-laying applications:

> *9) Attention is now directed to FIGS. 6, 7 and 8 which shows an embodiment of the invention concerning the lower horizontal roller of the pipe guide roller arrangement. A lower horizontal roller 210 is mounted on a frame 212 which is pivotally connected to element 214 of the center module frame 174 of the plow. A vertical support member 214 is rigidly attached at its upper end to the center module frame 174. A pivot 216 connects frame 212 in a pivotal manner to this vertical member 214. Horizontal load and position sensing roller 210 is pivotally supported from frame 212 by pivot 218. Frame 202 is connected to Tee member 230 which extends under roller 210 and supports pivot 218 on each end thereof. Thus, it is seen that with the roller 210 mounted on the extremity of the frame 212 from pivot 216 that the roller can traverse through a vertical arc. The frame 212, at its extremity from the end of pivot 216 is interconnected with the lower portion 175 of the center module frame 174 by a hydraulic linear actuator 220. Preferably, an accumulator type hydraulic circuit is incorporated with the hydraulic linear actuator, which is also*

commonly referred to as a gas over oil circuit, so as to cause the linear actuator to function as a gas spring. The ratio of gas to oil volumes and initial charge pressures are adjustable so as to be able to vary the spring rate. It is the nature of a gas spring for the pressure to increase in a mathematical curve as the cylinder is compressed.

(10) Piston rod 222 of hydraulic linear actuator 220 is pivotally connected at 224 to frame 212. The housing of the linear actuator 220 is connected at pivot 226 to member 175 of the center module frame 174.

(11) The gas spring can be calibrated so that the range of pressures generated by the spring travel could be interpreted to determine the horizontal roller travel in the vertical plane. Thus a specific pressure in an accumulator circuit could be converted to a specific vertical position of the horizontal roller 210. A hose 228 can be connected and be a part of the accumulator circuit and can extend to the barge so that the pressure of fluid in the hose 228 can be observed by the operator of the laying barge. FIG. 9 shows a hydraulic circuit for the gas spring arrangement of FIGS. 7 and 8. Hose or conduit 228 is connected to the lower end of a cylinder 250 which has gas 252 in the upper end and an oil at 254 in the lower end with an interface 256 therebetween. Hose 226 connects to the lower end of cylinder 250. Oil may be added or removed by use of valves 258 having outlet 268 and a conduit 270 in fluid communication with the hose 228. The upper end of the cylinder 250 is in fluid communication through conduit 264 to valve 260 and also to pressure gauge 262. Gas can be added through inlet 266 of valve 260 and conduit 264 to the upper end of cylinder 250. Thus this improved arrangement shown in FIGS. 6, 7, 8 and 9 allows the operator to know the position of the pipeline within the hiatus 194 (See FIG. 2) of the guide rollers which is preferable over just knowing when the pipe contacts the fixed horizontal roller.

(12) It can also be understood that the accumulator circuit working pressure can be adjusted so that the pressure generated from the horizontal roller 210 in the lowermost position of its travel range is sufficiently high so as to alert the operator that the force on the roller 210 was dangerously high and that the plow must be repositioned in relation to the barge.

(13) The gas spring support of the lower horizontal roller as shown in FIGS. 6, 7, 8 and 9 can be adjusted to provide a cushioning effect to the pipe. Thus when the pipe is undulating due to the sea state induced motions of the laying barge, which is very often the case, the impact of the pipe on the roller can be minimized thus greatly reducing the chance of damage to the pipe or its coating.

Further Re claims 47: Lynch teaches in col 7 line 37 - col 8 line 53 and Fig 9 that the force monitoring means' signals can be used to operate a piston and cylinder (piston

rod 222 of hydraulic actuator 220) arrangement via a hydraulic supply (254) and control valve (258) station.

4. Claims 22, 42-43 and 46-47 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Nolan in view of Jones et al. USP 3668878.

Re claims 22-29 and 36-40 and 42-43 and 45-47: Nolan teaches a pipe laying vessel and method comprising (page 3, 2nd, 6th, and 7th paragraphs, Figures) an upwardly extending tower (28,68) with a plurality of guiding element rollers (36), spaced along the pipeline path and defining lateral path limits, located such that the rollers allow some bending of the pipeline as it passes thru the lower guide arrangement (page 5, last 2 paragraphs – top 2 paragraphs page 6, figures, paragraph noted /25 on page 11). Nolan teaches in page 22, paragraph 56 of the translation that his invention is a method of laying pipe in which the angle at which the pipeline penetrates the water can be controlled, and thus inherently both s-laying and j-laying methods and apparatus are taught. Since both s-lay and j-lay are possible since the angle is controllable, the pipeline undergoes some bending such that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide whenever the pipeline penetration angle is less than vertical -- refer to the fact that the angle at which the pipeline penetrates the water can be controlled to be more or less vertical. Further, note that inherently ANY pipe that is eventually bent through guide rollers, as opposed to being physically clamped and mechanically bent at the clamped location) will inevitably and unavoidably have at least some "straight" pipe above the guide rollers affected by the bending so

that the pipeline as it passes through the lower guide arrangement will be less vertical than the straight pipe at the top of the tower -- the pipe sidewalls at the bend are not in a discrete and sudden bent shape. Guide rollers including axes of rotation inclined toward one another in a plane perpendicular to the tower, and defining the lateral limits of the pipeline, are taught in Nolan Fig 6. However, Nolan does not teach a means for monitoring the forces, including a load cell, applied to the pipeline by rollers of the lower guide arrangement.

Jones et al. teaches that "v-shaped roller assemblies 85 may be provided with force monitoring load cells" in col 23 lines 56-60, to minimize pipeline stresses and tension. Col 53 lines 51-73 further described the benefits of monitoring forces to enhance operator control and prevent serious deviations in forces, and that the monitoring data can be used to adjust parameters to ensure proper pipe laying. It would have been obvious to one of ordinary skill in the art, having the teachings of Nolan and Jones et al. before him at the time the invention was made, to modify Nolan to include guide rollers monitored for forces applied to the pipeline as taught by Jones et al. in order to insure pipe is laid properly and that excessive forces don't stress the pipeline. One would have been motivated to make such a combination because monitoring forces would prevent expensive maintenance problems later by allowing proactive adjustments to ensure proper pipe positioning and laying when laying the pipeline from a floating vessel in a catenary curve in the ocean without damage to the pipeline. Damage-free pipelaying in different conditions, such as pipe size, bend, water currents would have been obtained Monitoring the forces would prevent expensive

maintenance problems later by allowing proactive adjustments to ensure proper pipe positioning and laying.

Further Re claims 46-47: A flared tower as described is shown in Nolan Fig 3 and 12a-12d. The lower guide assembly is considered to include everything below bracketed section {34] in Fig 1. The angle of flare increases in the direction of pipeline travel during laying in the section between "68" and "88".

Further Re claim 47: A control station (150) of some type to monitor forces and provide data for operation adjustments is shown in Fig 24 of Jones.

Further Re claim 47: Jones teaches in col 21 lines and Fig 9 that the force monitoring means' signals can be used to operate a piston and cylinder arrangement via a hydraulic supply and control valve station:

(135) The segment 13a is provided with a plurality (in this case two) longitudinally displaced, vertical load sensing units 86 and 87 which are associated with longitudinally spaced pipe cradling, roller units 85a and 85b. The two vertical load sensing units 86 and 87 are substantially identical and illustrated in FIGS. 10, 11 and 14.

(136) Thus, for example, as shown in FIG. 14, load cell unit 86 comprises a load cell or transducer 88 which is fixedly attached on the top of a cross member 77c of pontoon segment 13a by a mounting bracket 89. Obviously, however, other load transducers of an hydraulic, pneumatic, mechanical or electrical nature may be employed. In lieu of hydraulic load cells electronic type load cells may be employed, suitably modified for underwater use.

(137) A force transmitting U-shaped, bracket 90 comprising legs 90a and 90b and an end member 90c is pivotally mounted on horizontally extending shaft means. Thus, shaft 91a connects leg 90a to a bracket 89a while shaft 91b connects leg 90b to a bracket 89b. Bracket means 89a and 89b are connected to, and extend aft from, cross member 77d.

(138) Force-transmitting bracket 90 has its end portion 90c disposed beneath, and in supporting engagement with, a bracket 92 which in turn supports roller unit 85a.

(139) A downwardly facing, force transmitting face 93 of bracket 92 is disposed in force transmitting engagement with load cell 88 and is located vertically between this load cell and roller unit 85a.

(140) Bracket 90 will pivot downwardly about coaxial shafts 91a and 91b in accordance with the pipeline load imposed through roller assembly 85a on bracket 92 and thus transmit an indication of this load to the load cell 88. This indication of load may be then relayed to an appropriate, monitoring or control station on the lay vessel 11 as an hydraulic, pneumatic, electrical, or

mechanical signal.
(141) By monitoring the operation of the load cells 88 associated with the load cell stations 86 and 87, an operator or control system on the lay vessel 11 may readily determine the condition of vertical load interaction between the pipeline and the lower or outermost stinger extremity. The term "vertical," as here used, is employed in a general sense encompassing the generally vertical vector involved in the normal or perpendicular interaction between the pipeline and load cell stations 86 and 87, even though this normal interaction itself is inclined relative to a vertical direction.
(142) Thus, for example, when the load cell 88 at the load station 86 indicates that no pipeline load is being transmitted to this station, the operator or control system knows that the tension exerted on the pipeline is such as to hold the pipeline out of supporting engagement with the roller station 85a or that the stinger has dropped. An operator or control system, upon detecting that the pipeline was no longer being supported by the roller station 85a, would be forewarned of impending excessive separation between the stinger 12 and the pipeline.

And page 11 lines 20-35 teach that a piston and cylinder are known hydraulically actuated assemblies for inducing convergence and separation:

(30) First motor means, comprising hydraulically actuated, linearly reciprocable, piston and cylinder assemblies 27 and 28 serve to move the frame 20 toward and away from the frame 21 so as to induce separation or convergence of the wheel means 23 and 26. Convergence of the frames 20 and 21, with the pipeline portion 4a disposed between the wheel units 23 and 26, causes the wheel units to compressively engage generally opposite upper and lower sides of the pipeline portion 4a. The degree of compression exerted on pipeline portion 4a by the motor means 27 and 28 may be selectively varied and adjusted. As will here be appreciated, the ultimate degree of compression exerted on the pipeline by the wheel units 23 and 26, as a result of the operation of motor means 27 and 28, will be limited by the inflation pressure of wheel units 23 and 26.

Further Re claims 42-43 and 47: Associating force monitoring means with guide rollers has been discussed above. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have had monitoring means on respective sets of rollers, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8, especially since a bending pipe would be expected to

have varying forces along its length and thus multiple measurements would obviously be needed.

Further Re Claim 47: Jones further shows in paragraphs 127-128 and 512-518 (below) that multiple set of guide rollers are evenly spaced and used below sea level to resist lateral movement and more easily form a curve when the pipe is being guided thru the water. The spacing and number of sets would be determined by pipe diameter, laying radius, and site conditions in order to help the pipeline to resist lateral movement and more easily form a curve when the pipe is being guided thru the water despite sea currents and ship movement.

127) As is shown in FIG. 10, the cross members 77 may serve to support longitudinally aligned and longitudinally spaced, pipe cradling roller assemblies 85. These roller assemblies are described, for example, in the aforesaid Rochelle et al. U.S. Pat. No. 3,507,126 and in the aforesaid Lawrence U.S. Pat. No. 3,390,532. These roller assemblies preferably support pipeline 1, with the pipeline centerline disposed beneath the center of buoyancy of segments 71 and 73.

(128) The roller assemblies 85, along with pipe cradling roller assemblies mounted on the ramp 17 of lay barge 11, serve to support the underside of the pipeline, while imposing impedance to pipeline lateral movement, and while stabilizing the pipeline during the laying operation as pipe segments move downwardly from the lay barge, over the stinger 12, and toward the ocean surface 2.

512) Where it is necessary to adjust the elevational position of the stinger 12, this may be accomplished by vertically adjusting the position of pivot unit 48. Alternatively, a desired modification in elevation of the pipeline in the transition zone between the vessel 11 and the stinger 12 could be effected by selectively adjusting the elevation of pipe cradling roller units on the ramp 17, in the manner generally described in the aforesaid Lawrence U.S. Pat. No. 3,390,532. The vertical adjustment of the pipeline in this transition zone may also entail the adjustment of elevation of the hitch unit 48, as well as adjustments in elevation of one or more pipe supporting cradles on the ramp 17.

(513) For the purpose of this disclosure, reference has been made to vertical load sensing means and lateral load sensing means located on the outermost stinger segment. It is contemplated, however, that such sensing means may be incorporated on several, or all, of the stinger segments.

(514) If a unitary stinger is employed, such as that described in the aforesaid Lawrence U.S. Pat. No. 3,390,532, such vertical and lateral load sensing means may be distributed longitudinally along the unitary stinger.

(515) By providing sensing means of this nature, distributed entirely or substantially along a stinger, enhanced operator control is provided. With

this arrangement, an operator may be able to anticipate serious deviations in vertical and lateral pipeline forces. Further, with such multiple condition sensing stations an operator, through monitoring of all of the stations, might be better able to selectively adjust the intensity and/or rate of condition correcting thrust vectors.

(516) Where a series of longitudinally displaced, lateral load cell units is provided, these load cell units could be positioned so as to define an aft directed, laterally diverging path, the peripheries of which are disposed on opposite lateral sides of the pipeline buoyantly supported by the stinger. With this arrangement, the spaced lateral load cell units on each side of the pipeline would generally define an allowable bending arc, so as to yield correction indicating signals only when lateral bending in excess of the allowable was developed.

(517) In the described embodiment, deviations with respect to tension and lateral interaction have been detected directly in the form of monitored force deviations. However, indications of force deviation may also be detected by monitoring the positioning of the pipeline relative to the floating vessel means.

(518) As will also be apparent, vessel hull shapes other than that described might be employed in practicing the invention. It is also feasible that tension motivating systems other than hydraulic systems might be employed.

Response to Arguments

5. Applicant's arguments filed 4/1/7/2006 regarding claims 22,42,43,46, and 47 have been fully considered but they are not persuasive. Applicant argues that Nolan does not teach j-laying, but as noted above, Nolan's inventive concept is being able to vary the angle of the pipeline going into the water, and thus would work with j-lay and s-lay techniques. Further, j-laying is distinguished from S-laying by the angle of the pipeline going into the water, and varying the angle would include angles less vertical as Since both s-lay and j-lay are possible since the angle is controllable, the pipeline undergoes some bending such that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide whenever the pipeline penetration angle is less than vertical -- refer to the fact that the angle at which the pipeline penetrates the water can be controlled to be more or less vertical. Further, note that inevitably ANY pipe that

is eventually bent through guide rollers, as opposed to being physically clamped and mechanically bent at the clamped location will inevitably and unavoidably have at least some "straight" pipe above the guide rollers affected by the bending so that the pipeline as it passes through the lower guide arrangement will be less vertical than the straight pipe at the top of the tower -- the pipe sidewalls at the bend are not in a discrete and sudden bent shape. Something at the lower guide roller has to impart some non-vertical direction to the pipeline to eventually form the "j" shape - if the pipe remained vertical through both the tower and the lower guide roller, the pipe would be a vertical pipe bent only by movement of the ship relative to the ocean. Examiern notes that even this movement would result in the pipeline at the lower guide arrangement being less vertical than when it passes thru tower assembly upstream.

Allowable Subject Matter

6. Claims 48, 23-29, 36-40, 45, 49-52 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W. Mitchell whose telephone number is 571-272-7069. The examiner can normally be reached on Mon - Thurs 10 AM - 8 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Katherine W Mitchell
Primary Examiner
Art Unit 3677

Kwm
6/22/2006

Katherine Mitchell

OK to enter
KWY
6/22/06

REPLACEMENT SHEET
Appln. Filing Date: April 18, 2002
Title: IMPROVEMENTS IN AND RELATING TO UNDERWATER PIPE-LAYING
Inventor(s): Teresio Signaroldi et al.
Appln. No.: 10/031,411 Sheet 1 of 1

Fig. 13